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## DETAILED DESCRIPTION

#### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to improvement of the connection fixation structure of a lead and a coil.

[0002]

[Description of the Prior Art] A coil is arranged in intersection with the shaft orientations of a lead, and the conventional structure which fixes the coil as a filament to the lead of the couple introduced into the valve of the electric discharge lamp is fixed to this lead by caulking attachment or welding. The emitter as an electron emitting material is applied in the winding coil which constitutes such a coil. Since such an emitter is gradually exhausted in an ion bombardment or electron bombardment, a complement must be secured according to a necessary life.

[0003]

[Problem(s) to be Solved by the Invention]However, if small tube-ization of a discharge lamp progresses, the interval of the lead which fixes the both ends of a coil according to it will become narrow, and the gap of the inner surface of a valve and a lead is also in the tendency made small. Since the wire size of a lead will also become very thin if the conventional coil fixing structure is adopted at this time, If a coil projects towards the internal surface of a valve from the side of a lead not a little and this contacts the internal surface of a valve, it is found out by this invention person that faults, such as a possibility that a crack may go into a valve, arise. It also becomes difficult to secure the necessary amount of emitters as the interval of a lead moreover becomes narrow. Then, since coil length was increased, this invention person found out the usefulness of the structure which turns the direction which examines incurvating a coil in the shape of an abbreviated U character, and fixing to a lead, and is substantially in agreement with the shaft orientations of a lead in the end of a coil as a result, and is fixed to a lead, and applied previously about it. Since a lead and a coil are fixed, when the fixing structure by melting coagulation, such as spot welding, is adopted at this time, The coil could not avoid thoroughly a possibility of contacting the wall of a valve according to the modification etc. which are produced with the power received at the time of the immobilization, or heat, but found out a possibility that a welding electrode might contact further at a coil in the case of spot welding, and a coil might be disconnected.

[0004]The purpose of this invention is to provide the discharge lamp of the structure which can be fixed to a lead by spot welding etc. without carrying out open-circuit \*\* of the coil which carried out the curved shape to the shape of an abbreviated U character. Another purpose of this invention is to provide

the discharge lamp of the structure which can fix the end of the coil concerned to a lead by spot welding etc. so that the overall shape of the coil which carried out the curved shape to the shape of an abbreviated U character may not change undesirably.

[0005]

[Means for Solving the Problem] In order that this invention may solve an aforementioned problem, to a lead of a couple introduced from an end of a container. A direction which is substantially in agreement with shaft orientations of the above-mentioned lead in an end of a coil which was wound spirally and formed in the shape of an abbreviated U character on the whole is turned, A discharge electrode of structure in which the whole surface inserted in the concave portion concerned of a corrosion plate formed in a concave, carried out melting coagulation of the position of lead end face slippage of this corrosion plate selectively, and fixed an end of the above-mentioned coil to a lead is adopted as a discharge lamp. In a pipe of a cylindrical member which is provided in a lead of a couple introduced from an end of a container and whose lead concerned and shaft orientations correspond substantially, An end of a coil which was wound spirally and formed in the shape of an abbreviated U character on the whole is inserted, and a discharge electrode of structure which carried out melting coagulation of the position of lead end face slippage of this cylindrical member selectively, and combined an end of the above-mentioned coil with a lead electrically is adopted as a discharge lamp.

[0006]

[Function] The structure which turned the direction which is substantially in agreement with the shaft orientations of the above-mentioned lead in the end of a coil, and was fixed acts so that a portion with an excessive coil end for fixing to a lead may be made to extend along a lead, and the end of a coil is kept from projecting towards the internal surface of a container according to the above-mentioned means. The above-mentioned corrosion plate and a cylindrical member act as protect members which prevent electrodes, such as an object for spot welding, from contacting a coil directly, respectively, and this prevents an open circuit of a coil. The position which a corrosion plate and a cylindrical member swerve [position] and carries out melting coagulation of the \*\* since the above-mentioned coil is fixed is considered as lead end face slippage of the longitudinal direction, and the coil of a to [from a melting solidified part / the exposed portion of a coil] is pinched, attached and restrained in the corrosion plate or the cylindrical member. Even if this binding force tends to change a coil with the heat by melting coagulation, it is corrected to linear shape, and the overall shape of a coil prevents the situation of inclining undesirably or bending.

[0007]

[Example] The left-hand side section of the discharge lamp concerning one example of this invention is typically shown in drawing 1. Let right-hand side which is not illustrated be left-hand side and the target structure. The discharge lamp 1 shown in the figure is applied, for example to the back light of an electrochromatic display device.

Although not restricted in particular, length is provided with the glass containers 2 of 500 mm or less at 8 mm or less, and let an outer diameter be a small fluorescent discharging lamp of a low-power-consumption type of 10 W or less for power consumption.

The fluorescent substance which is not illustrated was applied to the inner surface of the above-mentioned container 2, for example, a publicly known three-wave fluorescent substance was adopted, and high color rendering luminescence is realized. Inside the container 2, inactive gas, such as argon and a xenon, is filled up with the pressure of about 100 Torr from several 10 Torr(s), for example, and the

both ends of the container 2 are closed by the stem 4 which supported the discharge electrode 3, respectively.

[0008] Although the above-mentioned discharge electrode 3 in particular is not restricted, it is a preheated type discharge electrode.

The leads 5 and 5 of a couple are introduced from the both ends of the container 1, respectively, and it has the coil 6 which was wound spirally and formed in the shape of an abbreviated U character on the whole.

It functions on this coil 6 as a filament as filamentary cathode, and emitters, such as barium oxide, are applied or adhesion fixed in the coil which carried out multiple-times winding. Although the above-mentioned coil 6 in particular is not restricted in this example, it is considered as the double coil structure of having a core wire. The end of the \*\*\*\* coil 6 is being fixed by spot welding in the state where turn the direction which is substantially in agreement with the shaft orientations of the lead 5, and it was inserted into the lead concerned via the corrosion plate 7.

[0009] A detailed example of the fixing structure of the above-mentioned lead 5 and the coil 6 is shown in drawing 2, and the axial sectional view is shown in drawing 3. The end of the \*\*\*\* coil 6 is pinched by that a cross section is fabricated by half-rate arc shape, and the tip part of the lead 5 and each of the above-mentioned corrosion plate 7 oppose the tip part and the corrosion plate 7 of the lead 5 concerned. In this state, melting coagulation of the lead end face twist of the corrosion plate 7 is carried out selectively [ spot welding ], and the end of the above-mentioned coil 6 is fixed to the lead 5. The end of the fixed coil 6 has turned to the direction which is substantially in agreement with the shaft orientations of the above-mentioned lead 5. In each figure, 8 is the portion by which melting coagulation was carried out in spot welding.

[0010] Another example of the fixing structure of the above-mentioned lead 5 and the coil 6 is shown in drawing 4. The structure shown in the figure uses the cylindrical member 10 instead of the corrosion plate 7. That is, the end of the above-mentioned coil 6 is inserted into the pipe of the cylindrical member 10 fixed to the lead 5, melting coagulation of the lead end face slippage of this cylindrical member is selectively carried out in spot welding, and it has the structure which combined the end of the above-mentioned coil 6 with the lead 5 electrically.

[0011] In drawing 1, 9 is the mercury discharge structure and alloy getter which were applied or stuck to boards, such as nickel, by pressure. A mercury discharge structure changes with the decomposition product which this was decomposed and remained with the intermetallic compound or heat containing titanium and mercury, for example. This mercury discharge structure is for filling up the inside of the container 2 with mercury in order to make a fluorescent substance emit light with a mercury resonance line, and the intermetallic compound of mercury is disassembled with that heat, and it makes mercury emit to the inside of the container 2 by being heated after exhaust air closure of the container 2. That as which said alloy getter was chosen from among a zirconium and titanium, for example, It changes considering the intermetallic compound which comprises the thing selected from aluminum and nickel as a subject, and it is used in order to absorb the impurity gas emitted simultaneously with the pyrolysis of said mercury discharge structure, such as a steam and oxygen, and in order to absorb the impurity gas temporally emitted within the container 2.

[0012] According to the above-mentioned example, the following operation effects are obtained.

(1) According to the outer diameter of the container 2, even if the interval of the leads 5 and 5 is narrow, the necessary amount of emitters is securable by adopting the coil 6 made into the shape of an

abbreviated U character, and lengthening this coil 6.

(2) Compared with the case where a coil is only constructed over straight line shape, big effective luminous length can be obtained to the shaft orientations of the container 2.

(3) Since the direction which is substantially in agreement with the shaft orientations of the above-mentioned lead 5 in the end of the coil 6 was turned and it fixed, A portion with coil 6 excessive end for fixing to the lead 5 can be made to extend along the lead 5, and the end of the coil 6 can be prevented from projecting towards the internal surface of the container 2. Thereby, even when the path of the container 2 is thin, the interval of the leads 5 and 5 can be made large as much as possible, and a possibility that the amount of emitters is not only securable, but the end of the coil 6 may contact the inner surface of the container 2, and a crack may go into the container 2 can also be canceled.

(4) Each of the above-mentioned corrosion plate 7 and the cylindrical member 10 can act as a protect member which prevents the electrode for spot welding from contacting the coil 6 directly, and can prevent an open circuit of the coil 6 by this.

(5) The position 8 which carries out melting coagulation of the corrosion plate 7 or the cylindrical member 10 since the above-mentioned coil 6 is fixed is considered as lead end face slippage of the longitudinal direction, and the coil 6 of a to [ from the melting solidified part 8 / the exposed portion of the coil 6 ] is pinched, attached and restrained by the corrosion plate 7 or the cylindrical member 10. Even if this binding force tends to change the coil 6 with the heat by melting coagulation, it can correct it to linear shape, and it can prevent the situation of the overall shape of the coil formed in the shape of an abbreviated U character inclining undesirably, or bending. Therefore, a discharge electrode manufacturing process can be stabilized and can raise the improvement in the quality of an electrode, reduction of a working man hour, and the yield of a discharge lamp.

[0013] Although the invention made by this invention person above was concretely explained based on the example, it cannot be overemphasized that it can change variously in the range which this invention is not limited to it and does not deviate from the gist. For example, the discharge electrode of the above-mentioned example can be used also as an un-preheating type discharge electrode. A coil may not be limited to double coil structure, but may be triple coil structure. A corrosion plate may not be limited to half-rate arc shape, but may be triangular shape and rectangular shape, and it is [ corrosion plate ] selectable also in several kinds of shape of the tip part of a lead according to it. The cylindrical member 10 is not limited to what is fixed to the peripheral surface side of the lead 5 like drawing 4, but may be fixed to the tip part. The cylindrical member 10 concerned may be a member of integral moulding which fabricates the tip part of the lead 5 at this time.

[0014]

[Effect of the Invention] By adopting the structure which turned the direction which is substantially in agreement with the shaft orientations of a lead in the end of a coil, and was fixed according to the discharge lamp of this invention, A portion with an excessive coil end for fixing to a lead can be made to be able to extend along a lead, and the end of a coil cannot project towards the internal surface of a container, but a possibility that the coil end concerned may contact a container internal surface like before, and a crack may go into a container can be canceled thoroughly. Each of the above-mentioned corrosion plate and a cylindrical member can act as a protect member which prevents the electrode for welding from contacting a coil directly, and can prevent an open circuit of a coil by this. The position which carries out melting coagulation of a corrosion plate or the cylindrical member since the above-mentioned coil is fixed is considered as lead end face slippage of the longitudinal direction, and the coil

of a to [ from a melting solidified part / the exposed portion of a coil ] is pinched, attached and restrained in the corrosion plate or the cylindrical member. Even if this binding force tends to change a coil with the heat by melting coagulation, it can correct it to linear shape, and it can prevent the situation of the overall shape of the coil formed in the shape of an abbreviated U character inclining undesirably, or bending. By these, it can be coped with by high reliability to small-tube-izing of a container, and the narrowing of the lead line spacing accompanying this, and can contribute to the production man hour reduction, the quality stability, and the improvement in the yield in such a discharge lamp.

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[Translation done.]